

REMARKS

Upon entry of the present amendments, claims 2-38 will be pending. Claim 1 has been canceled without prejudice. Claims 2 and 21 have been amended to recite the claimed subject matter with even more clarity. Support for the amendments can be found in the specification, for example, at page 5, lines 16-21; page 8, lines 3-9; and page 28, line 25 to page 29, line 2. Claims 3-5, 7, 9, 11-13, 20, 22, 25, 27, 28, 30, 31, 33, and 38 have been amended to address informalities and make them consistent with the independent claims.

No new matter has been added.

Objection to the Abstract

The Office objected to the abstract. According to the Office (Office Action at pages 2-3), “[the] abstract of the disclosure is objected to because the abstract submitted (abstract of WO 03/079667 A1) is not in accordance to the instant specification it does not contain a concise statement to which the invention pertains. Correction is required. See MPEP § 608.01(b).”

Applicants respectfully point out that the abstract of WO 03/079667 A1 (the publication of the corresponding international application of the instant application) is not the same as the one that was provided with the instant application as filed. According to the records in Private PAIR, an abstract that describes the subject matter of the application is on page 61 of the application as filed. Applicants submit that the abstract as filed fully complies with the guidelines set forth in MPEP § 608.01(b). Accordingly, applicants respectfully request that the abstract as filed be entered and this objection be withdrawn.

The Invention

The instant claims are directed to a method of producing amplified RNA (aRNA) by reverse transcribing an RNA template to produce a first strand cDNA in a reaction that is completed in 45 minutes or less. The method also includes a step of producing a second strand cDNA complementary to the first strand cDNA in a reaction that is completed in 45 minutes or less.

As explained in the specification (page 8, lines 3-9):

... the reduction in reaction times by terminating the reaction and/or moving onto the next action reflects a truncation in the amount of time available for the production of various reaction products. Thus the use of "completed" in the above means that a reaction is terminated or that the next reaction begins. This reflects the surprising observation that such decreased time periods are sufficient to produce material sufficient to permit amplification without significant differences in the observed level of amplification (emphasis added).

Thus, applicants' method allows efficient amplification of RNA in less time than what a skilled practitioner would have expected to be necessary to produce an adequate amount of RNA.

35 U.S.C. 102(e)

The Office rejected claims 1, 3-7, 9-14 as allegedly anticipated by U.S. Pat. No. 6,794,138 ("Cao").

Applicants do not agree that Cao anticipates the claims. However, in the interest of moving this application toward allowance, applicants have canceled claim 1 without prejudice, thereby rendering the rejection against the claim moot. Claims 3-7 and 9-14 have been amended to depend from claim 2. Cao fails to teach every element of claim 2, for example, producing a second strand cDNA in 45 minutes or less (i.e., step (b) of claim 2). This is acknowledged by the Office in the Office Action at page 6. Thus, Cao does not anticipate claim 2 or its dependent claims (e.g., claims 3-7 and 9-14). Accordingly, applicants respectfully request that this rejection be reconsidered and withdrawn.

35 U.S.C. 103

The Office rejected claims 2, 20-23, 25-31, and 38 as allegedly obvious over Cao in view of Baugh et al. (Nucleic Acids Res., Vol. 29, No. 5e29 1-9,2001; here after as "Baugh"). In an attempt to support this rejection, the Office states (Office Action at page 7):

With regard to claim 2, 20, Baugh et al. teach said first and second strand cDNA synthesis is carried out in a reaction time less than 45 minutes (see page e29 2, col. 2, paragraph 1, indicating 40 min at 42° C and 10 min at 50° C).

It would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of producing amplified RNA as disclosed by Cao et al. in a manner as taught by Baugh et al. with a step of reducing time for synthesis of aRNA for the purpose of developing a rapid and quick method for producing aRNA. One skilled in the art would be motivated to combine the method as disclosed by Cao et al. with the method of Baugh et al. because an ordinary artisan would have a reasonable expectation of success that the combination would result in less process time and cost-effective method because Baugh et al. explicitly taught that the process time can be shorted depending on the incubation temperatures (see page e29 2, col. 2, paragraph 1) and such modification of the method would be obvious over the cited prior art (emphasis added).

Applicants respectfully disagree and traverse for the reasons stated below.

Amended claim 2 and its dependent claims 20-23, 25-31 and 38 are directed to a method of producing amplified RNA (aRNA) by reverse transcribing an RNA template to produce a first strand cDNA in a reaction that is completed in 45 minutes or less. The method further includes a step of producing a second strand cDNA complementary to the first strand cDNA in a reaction that is completed in 45 minutes or less.

The deficiency of Cao is acknowledged by the Office, as discussed above. Baugh fails to remedy this deficiency. The Office appears to conclude that Baugh discloses a reaction for producing a first strand cDNA or a second strand cDNA that takes less than 45 minutes to complete (see the underlined portion of the above quoted statement from the Office Action). Applicants submit that the Office has misconstrued Baugh. While the reaction includes multiple incubation times that are each less than 45 minutes, the reaction actually requires a total of about 60 minutes to complete (40 minutes at 42°C, 10 minutes at 50°C and 10 minutes at 55°C; see page 2, right column, line 5 of the first full paragraph). In fact, Baugh only describes reactions that take more than 45 minutes to produce a first strand cDNA or a second strand cDNA. For example, Baugh teaches producing a first strand cDNA in a reverse transcription reaction that requires 60 minutes at 42°C (see page 2, right column, lines 1-2 of the first full paragraph), and synthesizing a second strand cDNA in a reaction that requires 2 hours at 15°C (see page 2, left column, middle of the second full paragraph). Thus, while the Office is correct in pointing out that Baugh discloses different incubation times at different temperatures, Baugh does not suggest

completing a reaction in 45 minutes or less to produce a first strand cDNA or a second strand cDNA. As Baugh fails to teach such a reaction, there is nothing in Baugh that would have led a skilled practitioner to modify the method described in Cao to include the reaction in an attempt to arrive at applicants' method. Because neither Cao nor Baugh teach or suggest all of the steps of applicants' methods, even if a skilled practitioner were to combine the teachings of the two references the present invention would not have been obtained.

Moreover, contrary to what is asserted in the Office Action, a skilled practitioner would have had no reasonable expectation of success in performing such a method. As discussed above, applicants' method reflects the surprising result decreased reaction times are sufficient to allow amplification of RNA. Thus, a skilled practitioner would not have expected to amplify RNA by using the claimed method. The Office has not pointed to any evidence to suggest otherwise, nor is there anything in Cao or Bough themselves that would have led a skilled practitioner to believe that the claimed method would work.

In summary, Cao and Baugh, individually and combined, fail to teach or suggest all steps of the method of claims 2, 20-23, 25-31, and 38. Thus, applicants submit that the Office has failed to establish a *prima facie* case of obviousness against these claims. Further, even if a *prima facie* has been established (which it has not), it would have been rebutted by applicants' surprising result that the claimed method would work to amplify RNA. Accordingly, applicants respectfully submit that the references do not render the claims obvious, and request that the Office reconsiders and withdraws this rejection.

Next, the Office rejected claims 15-19 and 32-37 as allegedly obvious over Cao in view of Baugh and further in view of U.S. Pat. No. 6,027,945 ("Smith"). Applicants respectfully disagree and again submit that the Office has failed to establish a *prima facie* case of obviousness over this combination of references.

Claims 15-19 and 32-37 depend from claim 2. The deficiencies of Cao and Baugh are as discussed above. These references, individually and combined, fail to disclose the claimed method or render it obvious. Smith fails to remedy the deficiencies of these references. Smith discloses a method of isolating biological target materials

using silica magnetic solid particles (see Abstract). Smith does not teach producing a first strand cDNA or a second strand cDNA in a reaction that is completed in 45 minutes or less. Nor does it provide anything that would have led a skilled practitioner to modify the method disclosed in Cao to include such a reaction. Thus, Cao, Baugh and Smith, individually and in combination, fail to disclose or suggest all steps of the claimed method, and do not render the claims obvious. Applicants respectfully request that this rejection be reconsidered and withdrawn.

Lastly, the Office rejected claims 8 and 24 as allegedly obvious over Cao in view of Baugh, and further in view of U.S. Pat. No. 6,872,527 ("Gerdes"). Applicants respectfully traverse and submit that the Office has failed to establish a *prima facie* case of obviousness against these claims.

Claims 8 and 24 depend from claim 2. Cao and Baugh, individually and in combination, do not render the claimed method obvious for at least the reasons discussed above. Gerdes fails to rectify these deficiencies. Gerdes teaches methods for analyzing or manipulating nucleic acid molecules (see column 3, lines 23-30). The Office apparently cites Gerdes as disclosing genome wide amplification using 9-mer random primers (Office Action at page 9). Gerdes, therefore, fails to teach producing a first strand cDNA or a second strand cDNA in a reaction that is completed in 45 minutes or less, and so it does not rectify the deficiencies of Cao and Baugh. Further, there is nothing in Gerdes that would have led a skilled practitioner to a method including such a reaction. Cao, Baugh and Gerdes, individually and combined, fail to teach or suggest all steps of the claimed method and, therefore, a *prima facie* case of obviousness over these references has not been established. Applicants respectfully request that this rejection be reconsidered and withdrawn.

CONCLUSION

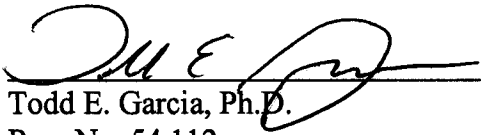
Applicants respectfully request that all claims be allowed. Applicants do not concede any positions of the Examiner that are not expressed above, nor do applicants

concede that there are not other good reasons for patentability of the presented claims or other claims.

The fee in the total amount of \$525 for the Petition for Extension of Time is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney's Docket No. 14255-052US1.

Respectfully submitted,

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